L2/09-310R

PONOMAR PROJECT

Proposal to Encode the Typikon Symbols in Unicode

Yuri Shardt, Aleksandr Andreev

L2/09-310

In Church Slavonic documents, for example, in the Orthodox Typikon, one encounters 4 common symbols that are used designate the rank of an ecclesiastical commemoration. Depending on the publisher and local convention, these symbols can be placed within the text or in the margins. Since these symbols are often found in Slavonic Church books, these symbols will be encoded in the "Extended Cyrillic Block B" of the Unicode standard.

Based on the information in Chapter 47 of the Orthodox Typikon ((Тѵ́пїкон сі́есть Оу́ставъ (Tipikon siject' Ustav), 1954), (Тѵ́пїкон сі́есть Оу́ставъ (Tipikon sijest' Ustav), 1965)) and local convention, the desired symbols, their characteristics, and proposed encoding region are described in Table 1. Two examples of Chapter 47 of the Typikon are presented in Figure 1 and Figure 2. As well, extracts from the Orthodox Menologion, where theses symbols are used to rank the commemorations, are given in Figure 3 and Figure 4. As can be seen from the sample publications, these symbols can occur anywhere in the line.

Table 1: Summary of the Proposed Typikon Symbols for Encoding

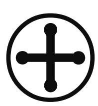
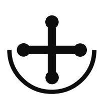
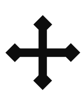
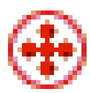
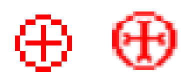
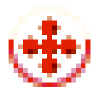
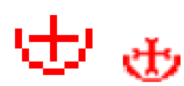
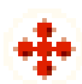
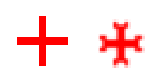
Typical Typikon Symbol	Proposed Name	Proposed Location	Comments
	Typikon Symbol Great Feast	U + A674	The cross need not be the same as the cross in the Typikon Symbol Polyeleos.
	Typikon Symbol Vigil Service	U + A675	The cross need not be the same as the cross in the Typikon Symbol Polyeleos.
	Typikon Symbol Polyeleos	U + A676	This symbol can be similar to U + 2722 (Four teardrop-spoked asterisk).
	Typikon Symbol Lower Rank	U + A677	Absolutely unique symbol

Table 2 shows the more common variants of the proposed Typikon symbols. The variants can be classified into 4 different types based on the types of crosses used. The first variant, Type I, has an equi-armed cross that is created using 5 circular beads. For each of the 3 symbols that require a cross, the same beaded cross is used. The second variant, Type II, has an equi-armed cross that resembles a Greek cross, except that there is some type of ornamentation on each of the cross arms. Furthermore, the crosses used for each of the 3 Typikon symbols can be quite different. For example, the cross for the Typikon Symbol Polyeleos has a diamond-like ornament on each arm (see Sources 2), 3), 4), and 5) in Table 2), while the cross for the Typikon Symbol Vigil Service and Typikon Symbol Great Feast has some type of deformed circular ornament on each arm that resembles that seen on the arms of the East Syriac Cross (U+2671). Other types of ornamentation on the arms of the cross include circles (cross pomée) which is often found in older Typika (see, for example, Source 6) in Table 2) as well as more modern versions (see, for example, Sources 4), 5), and 7) in Table 2). In Type II variants, the cross with any ornamentations can be either filled in (more common) or outlined only (rarer). The third variant, Type III, consists of an equi-armed cross whose arms are narrower at the middle than at the ends, which can be called either a "cross formée," or a variant of the Maltese cross, as encoded by Unicode. It can be noted that in Type III the same cross is used for all the 3 symbols that require a cross. Finally, the fourth variant, Type IV, is a miscellaneous category that consists of all variants that are hard to classify. The first example of Type IV consists of an equi-armed Greek cross, while the second example consists of an equi-armed cross forchée, which is similar in the ornamentations on the end to the West Syriac cross. In both cases, the same cross is used for all the Typikon symbols requiring a cross.

Although the variants have been classified primarily based on the cross types used, there are a few additional differences that need to be considered. Firstly, for the Typikon Symbol Vigil Service, the extent to which the semicircle encloses the cross varies greatly from an almost minimalist bottom hint as found in Father Dolnytskyj's Typikon (Dolnytskyj, 2009 (reprint)) (Source 10) in Table 2) to an almost total enclosure of the cross in the 1877-Trebnik (Kievan Cave Monastery of the Dormition, 1877) (Source 8) in Table 2). Secondly, for the Typikon Symbol Great Feast, the circle completely encloses the cross. Finally, for the Typikon Symbol Lower Rank, the 3 dots can be arranged in different forms. The most prevalent version is similar to "**:·**".

The usage of the different variants can be summarized as follows. Type I variants are used in current publications of the Russian Orthodox Church. Type II variants are found in older works of the Russian Orthodox Church (before 1917) published in Moscow and Pochaev, as well as Orthodox publications in the diaspora (after 1917) that followed the typographical layouts of Pochaev. The Type II variant is the most common variant encountered. Type III variants are used by publications following the traditions of the Kievan Cave Monastery of the Dormition, which includes publications by the Ukrainian Orthodox Church. Finally, Type IV variants can be found in publications located anywhere in the world.

Table 2: Comparison of the More Common Variants of the Typikon Symbols.

Typical Symbol	Type I 1)	Type II 2), 3), 4), 5), 6), 7)	Type III 8), 9), 10)	Type IV 11), 12)
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🕁				
🕂				
🕃				

Sources:

1) As used on the website of the Russian Orthodox Church (Православный каленарь).
2) As used in (Тѷпїкон сі́есть Ѹ҆ставъ (Tipikon siject' Ustav), 1954)
3) As used in (Тѷпїкон сі́есть Ѹ҆ставъ (Tipikon sijest' Ustav), 1965)
4) As used in a digitized version of an early 20th-century Typikon (Churchill)
5) As used in a scanned, pdf version of a 1896 Typikon published in Moscow (Литугия.ру)
6) As used in the 1641 Typikon published in Moscow. The Typikon Symbol Vigil Service is missing.
7) As used in the Horologion published in 1964 by the Monastery of the Holy Trinity in Jordanville, New York, USA (Monastary of the Holy Trinity, 1964).
8) As used in the Trebnik published at the Kievan Cave Monastery of the Dormition of the Mother of God in 1877 (Kievan Cave Monastery of the Dormition, 1877). The last symbol was not found in this Trebnik.
9) As used in the paper published by Mary Krasovickaja (Красовицкая).
10) As used in *The Prayerful Eye: The Typikon of the Ukrainian Greek-Catholic Church of Father Isidore Dolnytskyj* (Dolnytskyj, 2009 (reprint)).
11) As used on the website of the Holy Trinity Russian Orthodox Church (Orthodox Calendar Holy Trinity Russian Orthodox Church).
12) As used by the Slovak Byzantine Rite Church (Gajdoš, 2009).

Based on the above analysis, it can be concluded that the cross used in the Typikon symbols must be equi-armed. In the vast majority of cases, this cross has either some ornamentation on each of the 4 arms or resembles a cross formée. The three crosses that are used in the different Typikon symbol need not be the same.

Having determined the characteristics of the crosses used for the Typikon symbols, it will now be necessary to compare them with already encoded Unicode crosses and asterisks. Table 3 shows all the relevant Unicode symbols as well as an explanation of their suitability for encoding the cross-like Typikon Symbols. A brief summary will be presented here. Since it has been determined that the cross in the Typikon Symbols must be equi-armed, the following Unicode crosses are all inappropriate as they are not equi-armed: U+2020 (dagger cross), U+2670 (West Syriac Cross), U+2671 (East Syriac Cross), U+2626 (Orthodox Cross), U+2628 (Cross of

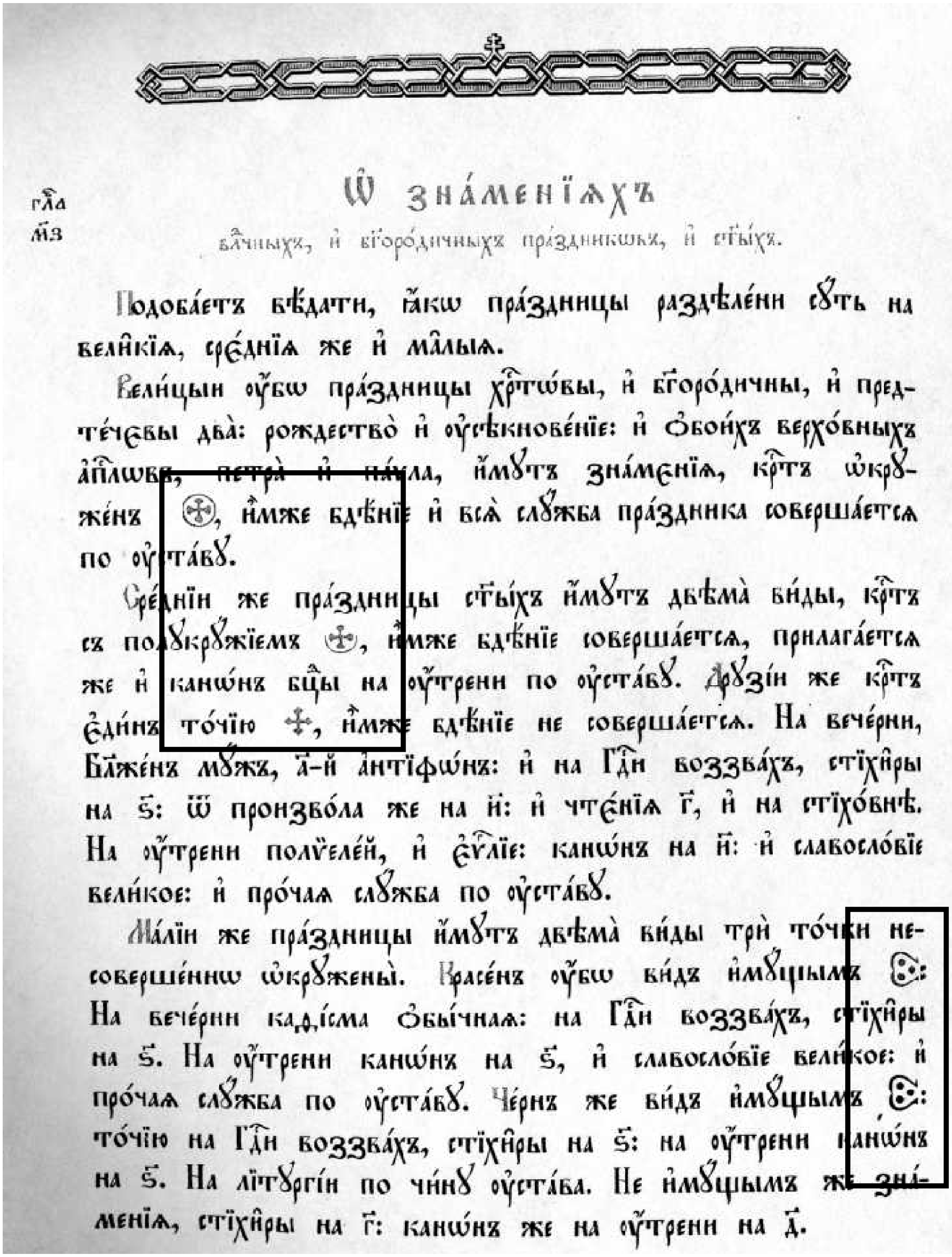
Lorraine), U+271D (Latin Cross). Of the remaining equi-armed crosses, U+2722 (Greek Cross) and U+271A (Heavy Greek Cross), do not cover the most common forms of the crosses used for the Typikon symbols, that is, the cross is missing the ornaments found on the ends of the cross. The Maltese cross (U+2720) and its variants only cover Type III Typikon crosses. All Type II crosses, which are by far the most common, would not be covered, as the Maltese cross does not have the ornaments found on the end of the crosses. The remaining Unicode crosses (U+2722, U+2723, U+2724, U+2725) are actually four-spoked asterisks that have various ornaments on the ends. None of these cover all the variants presents. Of the asterisks, only the four-teardrop-spoked asterisk resembles some of the Type II cases. Thus, based on an overview of all the available already encoded Unicode crosses/asterisks it can be seen that the vast majority of the Typikon symbols variants cannot be encoded using the currently available symbols. Furthermore, it can be noted that if there is a unified location for each Typikon symbol then this would increase the efficiency of sorting and ranking the various Orthodox feasts.

It can be noted that in recent years, there has been an increased demand for Typikon symbols to be encoded as characters, both on the Internet and commercially. For example, the Orthodox Liturgical texts project (http://www.orthlib.info/) has digitised the Church Slavonic Orthodox Typikon and Menologion. Other projects, for example, http://www.canto.ru/calendar present Orthodox calendars for the current or upcoming year. Such projects have either used graphics for the Typikon symbols or have designed various non-Unicode compatible fonts.

Table 3: Comparison between the Already Encoded Unicode Crosses and the Proposed Typikon Symbols

Already Encoded Unicode Crosses	Comparison with the Typikon Symbols
✢ (Greek Cross) U+2722, ✚ (Heavy Greek Cross) U+271A	Does not have the ornaments found in most of the published variants of the cross. This cross could cover only some of the Type IV variants.
✠ (Maltese Cross) U+2720	This cross is basically used by Type III variants. Some of the Type II and Type IV could be considered to be variants of the Maltese Cross, for example, the Cross Formée. However, the Maltese Cross does not represent the Type I forms, which have 5 beads arranged in the form of a cross.
☩ (Cross of Jerusalem) U+2629	Although a variant of the cross only contains the larger middle cross, it can be seen that none of the variants have this form.

Already Encoded Unicode Crosses	Comparison with the Typikon Symbols
♰ (West Syriac Cross) U+2670	This cross is not equi-armed which immediately disqualifies it as all Typikon crosses are equi-armed.
♱ (East Syriac Cross) U+2671	This cross is likewise not equi-armed which immediately disqualifies it as all Typikon crosses are equi-armed.
✢ (Four-teardrop-spoked asterisk) U+2722	This cross/asterisk only represents some of the Type II variants.
✣ (Four balloon-spoked asterisk) U+2723, ✤ (Heavy Four balloon-spoked asterisk) U+2724	This cross/asterisk would only represent Type I variants of the Typikon symbols and then only barely, as the Type I variants are created from 5 beads that touch tangentially. None of the other variants would even be considered as variants of this symbol.
✥ (Four clubbed-spoked asterisk)	This cross/asterisk does not represent any of the variants of the Typikon symbols that were encountered.
☦(Orthodox Cross) U+2626, ☨(Cross of Lorraine) U+2628, ✝ (Latin Cross) U+271D, † (Dagger Cross) U+2020	None of these cross have any of the features of the Typikon crosses: equi-armed cross without any additional bars.


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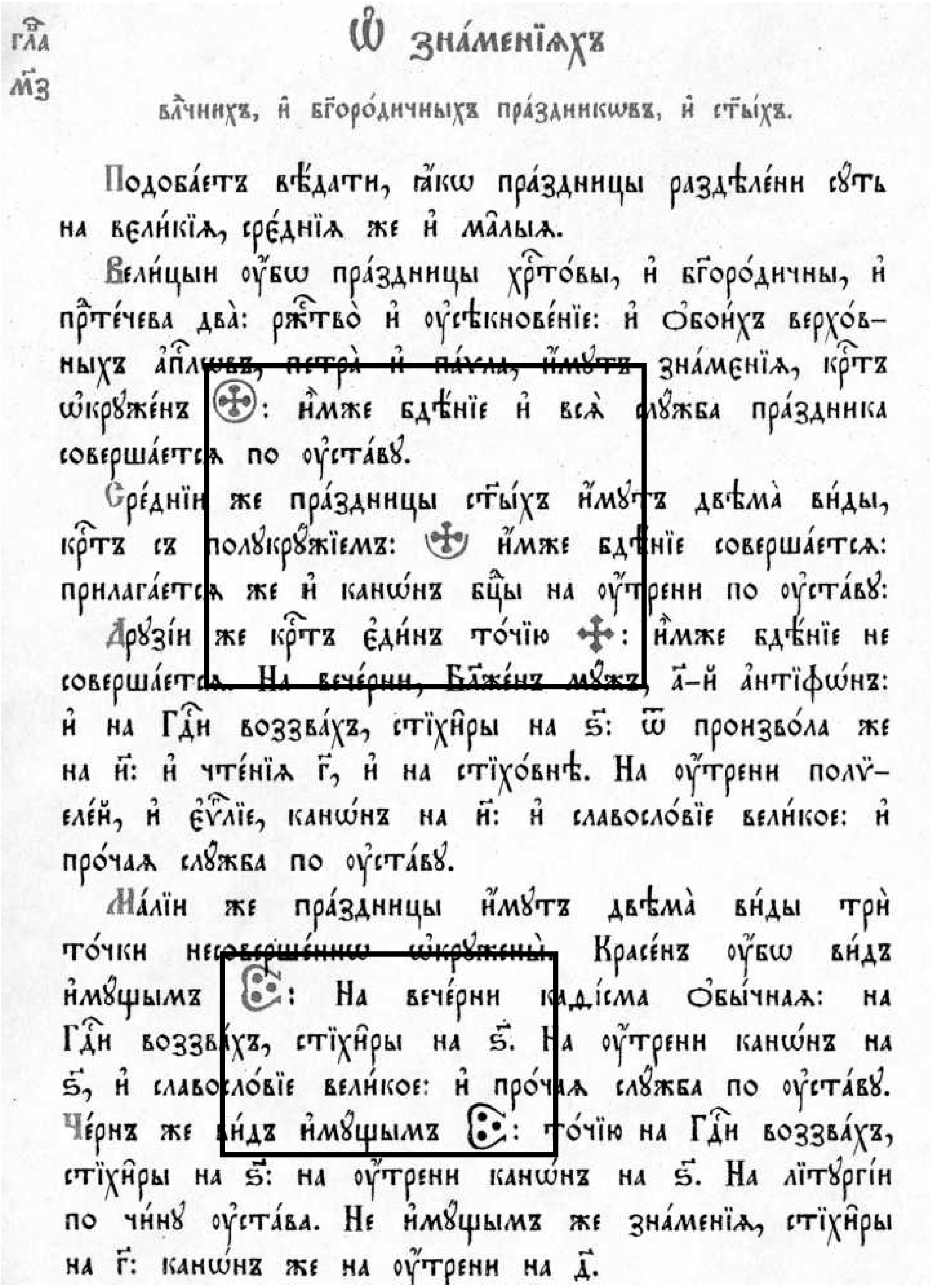
Подоба́етъ вѣ́дати, ꙗ҆́кѡ пра́здницы раздѣле́ни сꙋ́ть на вели́кїа, сре́днїа же и҆ ма́лыѧ.

Вели́цыи ѹ҆́бѡ пра́здницы хрⷭ҇то́вы, и҆ бⷢоро́дичны, и҆ предте́чевы два̀: рождество̀ и҆ ѹ҆сѣкнове́нїе: и҆ ѻ҆бои́хъ верхо́вныхъ а҆плⷭ҇овъ, петра̀ и҆ па́ѵла, и҆́мꙋтъ знаме́нїа, крⷭ҇тъ ѡ҆крꙋже́нъ ⊕, и҆́мже бдѣ́нїе и҆ вса̀ слꙋ́жба пра́здника соверша́етсѧ по ѹ҆ста́вꙋ.

Сре́днїи же пра́здницы ст҃ы́хъ и҆́мꙋтъ двѣма̀ ви́ды, крⷭ҇тъ съ полꙋкрꙋ́жїемъ ☩, и҆́мже бдѣ́нїе соверша́етсѧ, прилага́етсѧ же и҆ кано́нъ бцⷣы на ѹ҆́трени по ѹ҆ста́вꙋ. Дрꙋзі́и же крⷭ҇тъ є҆ди́нъ то́чїю ✠, и҆́мже бдѣ́нїе не соверша́етсѧ. На вече́рни, бл҃же́нъ мꙋ́жъ, а҃-й а҆нтїфѡ́нъ: и҆ на Гдⷭ҇и воззва́хъ, стїхи̑ры на ѕ҃: ѿ произво́ла же на и҃: и҆ чтє́нїа г҃, и҆ на стїхо́внѣ. На ѹ҆́трени полѷеле́й, и҆ є҆ѵⷢ҇лїе: кано́нъ на и҃: и҆ славосло́вїе вели́кое: и҆ про́чаѧ слꙋ́жба по ѹ҆ста́вꙋ.

Ма́лїи же пра́здницы и҆́мꙋтъ двѣма̀ ви́ды трѝ то́чки несоверше́ннѡ ѡ҆крꙋже́ны. Красе́нъ ѹ҆́бѡ ви́дъ и҆́мꙋщымъ ⁘: На вече́рни каѳі́сма ѻ҆бы́чнаѧ: на Гдⷭ҇и воззва́хъ, стїхи̑ры на ѕ҃. На ѹ҆́трени кано́нъ на ѕ҃, и҆ славосло́вїе вели́кое: и҆ про́чаѧ слꙋ́жба по ѹ҆ста́вꙋ. Че́рнъ же ви́дъ и҆́мꙋщымъ ⁘: то́чїю на Гдⷭ҇и воззва́хъ, стїхи̑ры на ѕ҃: на ѹ҆́трени кано́нъ на ѕ҃. На лїтꙋргі́и по чи́нꙋ ѹ҆ста́ва. Не и҆́мꙋщымъ же знаме́нїа, стїхи̑ры на г҃: кано́нъ же на ѹ҆́трени на д҃.

Figure 1: Chapter 47 of the Typikon (Тѷпїкѡнъ сі́есть Ѹ҆ста́въ (Tipikon sijest' Ustav), 1965). The desired symbols have been boxed.



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владичнихъ, и богородичныхъ праздникѡвъ, и святыхъ.

Подобаетъ вѣдати, ꙗкѡ праздницы раздѣлени сꙋть на великїѧ, среднїѧ же и малыѧ.

Велицыи ꙋбѡ праздницы христовы, и богородичны, и предтечева два: рождество и ꙋсѣкновенїе: и ѻбоихъ верховныхъ апостолѡвъ, петра и павла, имꙋтъ знаменїѧ, крестъ ѡкрꙋженъ: имже бдѣнїе и всѧ слꙋжба праздника совершаетсѧ по ꙋставꙋ.

Среднїи же праздницы святыхъ имꙋтъ двѣма виды, крестъ съ полꙋкрꙋжїемъ: имже бдѣнїе совершаетсѧ: прилагаетсѧ же и канѡнъ богородицы на ꙋтрени по ꙋставꙋ:

Дрꙋзїи же крестъ єдинъ точїю: имже бдѣнїе не совершаетсѧ. На вечерни, Блаженъ мꙋжъ, а҃-и антїфѡнъ: и на Господи воззвахъ, стїхиры на ѕ҃: ѿ произвола же на и҃: и чтенїѧ г҃, и на стїховнѣ. На ꙋтрени полѵелей, и єѵангелїе, канѡнъ на и҃: и славословїе великое: и прочаѧ слꙋжба по ꙋставꙋ.

Малїи же праздницы имꙋтъ двѣма виды три точки несовершенны ѡкрꙋжены. Красенъ ꙋбѡ видъ имꙋщымъ: На вечерни каѳїсма ѻбычнаѧ: на Господи воззвахъ, стїхиры на ѕ҃. На ꙋтрени канѡнъ на ѕ҃, и славословїе великое: и прочаѧ слꙋжба по ꙋставꙋ. Черенъ же видъ имꙋщымъ: точїю на Господи воззвахъ, стїхиры на ѕ҃: на ꙋтрени канѡнъ на ѕ҃. На лїтꙋргїи по чинꙋ ꙋстава. Не имꙋщымъ же знаменїѧ, стїхиры на г҃: канѡнъ же на ꙋтрени на д҃.

Figure 2: Chapter 47 of a different Typikon (Тѵпїконъ сїесть Ѹставъ (Tipikon siject' Ustav), 1954). The symbols have been boxed.

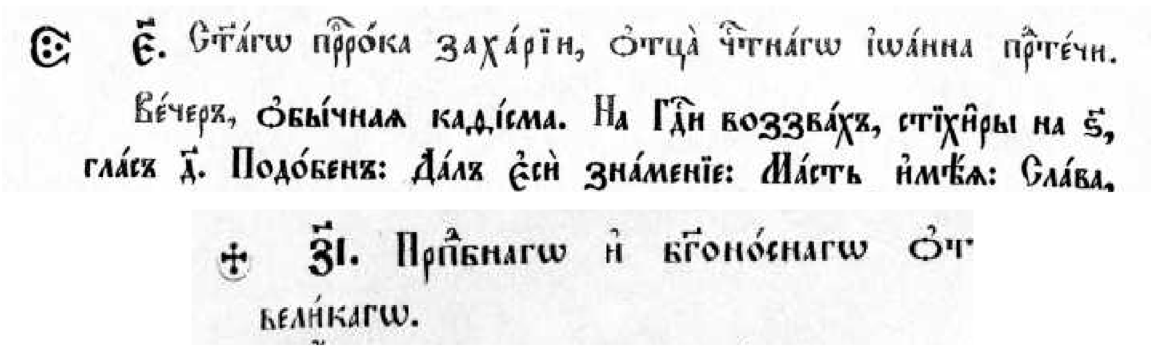


Figure 3: Extracts from the Menologion showing the use of some of the proposed symbols (Тѵпїкон сіесть Оуставъ (Tipikon sijest' Ustav), 1965).

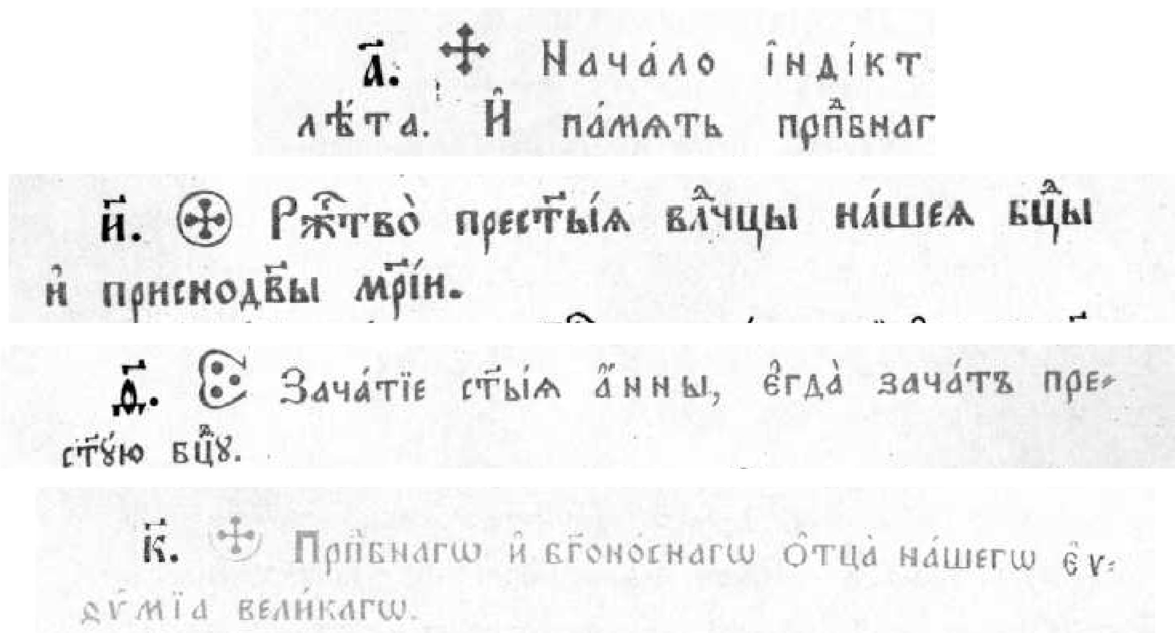
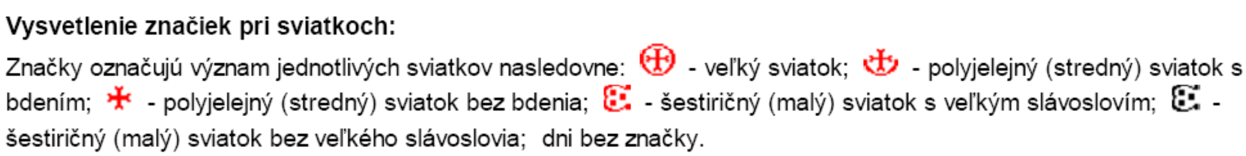


Figure 4: Extracts from the Menologion showing the use of the proposed symbols (Тѵпїкон сіесть Оуставъ (Tipikon siject' Ustav), 1954).



Vysvetlenie značiek pri sviatkoch:

Značky označujú význam jednotlivých sviatkov nasledovne: ⊕ - veľký sviatok; ♁ - polyjelejný (stredný) sviatok s bdením; ✱ - polyjelejný (stredný) sviatok bez bdenia; ⁝ - šestiričný (malý) sviatok s veľkým slávoslovím; ⁝ - šestiričný (malý) sviatok bez veľkého slávoslovia; dni bez značky.

Figure 5: Example of the Typikon symbols as used by the Slovak Byzantine Rite Church (Gajdoš, 2009).

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ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**
See also http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** ***Proposal to Encode the Typikon Symbols in Unicode***
2. Requester's name: *Yuri Shardt, Aleksandr Andreev*
3. Requester type (Member body/Liaison/Individual contribution): *Individual Contribution*
4. Submission date: *August 18, 2009*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *YES*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *NO*
      Proposed name of script:
   b. The proposal is for addition of character(s) to an existing block: *YES*
      Name of the existing block: *Cyrillic Extended Block B*
2. Number of characters in proposal: *4*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary ___ B.1-Specialized (small collection) *Yes* B.2-Specialized (large collection) ___
   C-Major extinct ___ D-Attested extinct ___ E-Minor extinct ___
   F-Archaic Hieroglyphic or Ideographic ___ G-Obscure or questionable usage symbols ___
4. Is a repertoire including character names provided? *YES*
   a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? *YES*
   b. Are the character shapes attached in a legible form suitable for review? *YES*
5. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard? *Yuri Shardt*
   If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used: *Hirmos Ponomar v.3 (contact Yuri Shardt at yuri.shardt@ualberta.ca for the font)*
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *YES*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *YES*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *NO*

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see http://www.unicode.org/Public/UNIDATA/UCD.html and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

[1] Form number: N3152-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *NO*
   If YES explain
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? *YES*
   If YES, with whom? *Members of the Orthodox publishing community*
   If YES, available relevant documents:
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? *>200 million*
   Reference: *http://en.wikipedia.org/wiki/Orthodox_Church*
4. The context of use for the proposed characters (type of use; common or rare) *common*
   Reference:
5. Are the proposed characters in current use by the user community? YES
   If YES, where? Reference: *In publications of the Typikon and Menologion*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *NO*
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? *YES*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *NO*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? *NO*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character? *YES*
    If YES, is a rationale for its inclusion provided? *YES*
    If YES, reference:
11. Does the proposal include use of combining characters and/or use of composite sequences? *NO*
    If YES, is a rationale for such use provided?
    If YES, reference:
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? *NO*
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility character(s)? *NO*
    If YES, is the equivalent corresponding unified ideographic character(s) identified?
    If YES, reference: